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EXAMINER

NORMAN, MARC E

ART UNIT

PAPER NUMBER

3744

DATE MAILED: 05/17/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	09/988,111	DUBE, SERGE
	Examiner Marc E. Norman	Art Unit 3744

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) Responsive to communication(s) filed on 19 November 2001.

2a) This action is **FINAL**. 2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) Claim(s) 1-10 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) Claim(s) _____ is/are allowed.

6) Claim(s) 1-3, 6, 7 and 9 is/are rejected.

7) Claim(s) 4, 5, 8 and 10 is/are objected to.

8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on 19 November 2001 is/are: a) accepted or b) objected to by the Examiner.

 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.

 If approved, corrected drawings are required in reply to this Office action.

12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All b) Some * c) None of:

1. Certified copies of the priority documents have been received.

2. Certified copies of the priority documents have been received in Application No. _____.

3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) The translation of the foreign language provisional application has been received.

15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) Notice of References Cited (PTO-892) ✓

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____

4) Interview Summary (PTO-413) Paper No(s) _____.

5) Notice of Informal Patent Application (PTO-152)

6) Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 3, the claim recites the limitation "said condensing stage closed loop." It is noted, however, that base claim 1 refers to "at least a pair of stand-alone condensing stage closed loops." It is unclear which condensing stage closed loop is being referred to in the claim. For purposes of examination on the merits below, it is assumed that the limitation refers to either one of the pair of condensing stage closed loops.

Claim Rejections - 35 USC § 103

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 6, 7, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kantchev in view of Tippmann.

As per claim 1, Kantchev teaches a refrigeration system having a main refrigeration circuit (Figure 2), wherein a first refrigerant goes through a compressing stage wherein the first refrigerant is compressed to a high pressure gas state (compressors 2; column 3, lines 57-60); a condensing stage wherein the high pressure gas refrigerant is condensed at least partially to a liquid state (condenser 10 and heat exchanger 28; column 3, line 62); an expansion stage wherein the high pressure liquid refrigerant is expanded to a low pressure liquid state (expansion valves 20); and an evaporator stage wherein the low pressure liquid refrigerant is evaporated at least partially to a low pressure gas state by absorbing heat (evaporators 4) to then return to the compressing stage. Kantchev further teaches the condensing stage having one stand-alone condensing stage closed loop 38 (Figure 2) and a second condensing unit 10, each of which are in heat exchange relation with the main refrigeration circuit (Figure 2), the loop 38 and condenser being arranged parallel one to another (see piping structure of Figure 2), the loop 38 comprising a second refrigerant (column 4, line 38) circulating between a heat absorption stage wherein the second refrigerant absorbs heat from the first refrigerant (at condensing heat exchanger 28) so as to condense the first refrigerant to a liquid state, and a heat release stage wherein the second refrigerant releases the absorbed heat (at condensers 48, 50, 52, and 78), the condensing stage having modulating valve 8 for selectively and quantitatively modulating the temperature of the first refrigerant and compressor head pressure (by controlling the degree of heat exchange with condensing heat exchanger 28, which thus affects the temperature and head pressure of the refrigerant).

Kantchev does not teach the second condensing unit 10 comprising a stand-alone closed loop comprising a second refrigerant circulating between a heat absorption stage wherein the second refrigerant absorbs heat from the first refrigerant so as to condense the first refrigerant to a liquid state, and a heat release stage wherein the second refrigerant releases the absorbed heat, and thus does not also teach two closed loops being parallel one to another.

Tippmann teaches a refrigeration system having a main refrigeration circuit (circuit including compressor 15, evaporator 13, and condenser 17) and a stand-alone (with respect to the main refrigeration circuit) closed loop (loop containing pump 21) comprising a second refrigerant (column 4, lines 34-35) circulating between a heat absorption stage (at enclosure 19) wherein the second refrigerant absorbs heat from the first refrigerant so as to condense the first refrigerant to a liquid state (at condenser 17), and a heat release stage wherein the second refrigerant releases the absorbed heat (at enclosure 23). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply this second refrigerant closed loop circuit of Tippmann to the condenser 10 of Kantchev for the purpose of cooling the condenser by thermally connecting it to a secondary cooling system (cooling loop of Tippmann that includes compressor 29, evaporator 25, and condenser 63).

It is further noted that if this stand-alone closed loop is applied to the system of Kantchev for the purpose of cooling condenser 10, the loop would in fact be situated in parallel to the first stand-alone closed loop 38 of Kantchev (since, as already discussed above, the compressor 10 of Kantchev is already situated in parallel to stand-alone closed loop 38). Accordingly, it would also have been obvious to one of ordinary skill in the art at the time the invention was made to situate the two closed loops parallel one to another since Kantchev already teaches circuit 38 and

condenser 10 operating in parallel, and since, if the closed loop circuit of Tippmann is simply applied for the purpose of cooling the condenser by thermally connecting it to a secondary cooling system as discussed above, it would also naturally be situated in parallel with the first closed loop of Kantchev.

As per claim 2, Kantchev does not teach the second refrigerant being one of the listed refrigerants. Tippmann teaches the second refrigerant being ethylene glycol (column 4, lines 34-35). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize ethylene glycol in both of the closed loop circuits for the purpose of transferring heat from the heat absorption stage to the heat release stage, since ethylene glycol is a well known heat transfer fluid, and particularly since ethylene glycol is already being used within the closed loop circuit of Tippmann.

As per claim 3, Kantchev teaches the heat relation between the main refrigeration circuit and the condensing stage closed loop 38 being achieved by plate heat exchanger 28 (as illustrated in Figure 2). (Note the discussion under 35 U.S.C. 112, 2nd paragraph, regarding the Examiner's interpretation of this claim.)

As per claim 6, Kantchev does not specifically discuss the means of the heat release stage of the first closed loop circuit. Tippmann teaches the absorbed heat from the second refrigerant in the heat release stage being evacuated outdoors (via the second stage closed loop refrigeration circuit, and in particular via condenser 27 (column 4, lines 27-28)). It would have been obvious to one of ordinary skill in the art at the time the invention was made to apply this feature of Tippmann to the system of Kantchev for the purpose of removing heat from the system, since atmospheric heat exchange is common and well known in the art of refrigeration, and since this

is simply one aspect of the overall cooling system of Tippmann that is being applied to Kantchev for the reasons already discussed with regard to claim 1.

As per claim 7, Kantchev teaches valves (84, 54, 56, and 58) for selecting the releasing of absorbed heat from the second refrigerant in the heat release stage.

As per claim 9, Kantchev teaches modulating valves 8 selectively and quantitatively directing flow of the first refrigerant for heat exchange with the closed loop 38 and condenser 10 (and thus, by extension, with the closed loop of Tippmann for the reasons already discussed with regard to claim 1).

Allowable Subject Matter

Claims 4, 5, 8, and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

As per claims 4 and 5, neither Kantchev nor Tippmann teaches the second one of the closed loops comprising an evaporative condenser.

As per claim 8, Kantchev does not teach an absorbed heat reservoir downstream from the heat absorption stage in the first closed loop.

As per claim 10, Kantchev does not teach the modulating valve means comprising two modulating valves and a three-way directional valve connecting the compressing stage to the condensing stage.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ives teaches a dual refrigerant cascade refrigeration system.

Conry teaches a cascade refrigeration system in which a heat transfer fluid is used to cool multiple condensers.

Dubé (U.S. Patents 6,089,033; 5,826,433; and 5,673,567) are patents by the inventor of the present application which were referenced in the background section of the specification.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marc E. Norman whose telephone number is 703-305-2711. The examiner can normally be reached on Mon.-Fri., 8:00-5:30, with first Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Denise Esquivel can be reached on 703-308-2597. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9302 for regular communications and 703-872-9303 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-306-5648.

MN
May 10, 2002

Marc Norman
Marc Norman
Patent Examiner
Art Unit 3744